COMPARISON OF DISTANCES BY THE ISTHMIAN CANAL AND OTHER ROUTES.

BY

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In determining what commerce would use an isthmian canal, the fact of most fundamental importance is the effect which the new waterway will have on the ocean distances between the trade centres adjacent to the Atlantic, and those in and about the Pacific. The length of the route determines the time of the voyage, and, in general, the commerce of the world is so conducted as to minimize distances as much as the conditions of ocean navigation and international exchanges permit. Accordingly, a discussion of the traffic of an isthmian canal should be preceded by a comparison of the distances between the Atlantic and Pacific, by way of the American isthmus, with those by way of the various routes now followed. This comparison can best be made by means of a series of tables,* giving the distances by alternative routes between the most important commercial centres. In most respects the tables are self-interpretative. The distances are expressed in nautical miles, and the figures used in compiling the tables were furnished by the United States Hydrographic Office. The length of each canal is reckoned in nautical miles, the Nicaragua Canal being 161 nautical miles long, the Panama 41, and the Suez 88.

In the first table a comparison is made between the distances by the Nicaragua Canal with those by the Straits of Magellan between the Atlantic and Gulf seaboard of the United States and the west coast of North, Central, and South America. This table compares the distances by way of the Nicaragua Canal with those through the Straits of Magellan, from the chief ports of our Atlantic and Gulf seaboard, extending from Portland and Galveston to thirteen representative ports on the west coast of the American continents. Coronel, the most southerly of the west coast ports mentioned in the table, is situated within two or three hundred miles of the southern limits of the industrial section of Chile. It is also an important coaling port at the present time. It will be observed that the distance from New York to Coronel, by way of the Nicaragua Canal, is 3,069 miles less than the present route through the Straits of Magellan.

* Tables I–VIII on pages 169–176.

The effect of an isthmian canal upon the length of ocean routes, connecting our Eastern seaboard with the west coast of the three Americas, is well shown by comparing the distances by way of the Nicaragua Canal and the Straits of Magellan from New York, the largest Atlantic port, and from New Orleans, the largest Gulf port, to San Francisco, the representative west coast city of the United States; to Iquique, the centre of the nitrate of soda section; and to Coronel, in southern Chile. This comparison is shown in the following table:

	New York.		New Orleans.	
	via Nicaragua.	via Magellan.	via Nicaragua.	via Magellan.
San Francisco	4,921	13,714	4,118	14,114
Iquique	4,393	9,221	3,590	9,621
Coronel	5,161	8,230	4,358	8,360

In Table II the distances from representative European ports to the west coast of the American continents by the Nicaragua and Magellan routes are given.

The European ports included in Table II are so situated that the distances from them to Pacific ports typify the distances from the leading industrial and commercial centres of Europe. It will be observed that the distance from Liverpool to Coronel, by way of the Nicaragua Canal, will be 709 miles less than by the route through the Straits of Magellan. The route to the nitrate port of Iquique will be shortened 2,468 miles. San Francisco will be brought 6,433 miles nearer to Liverpool, and 5,780 miles nearer to Gibraltar.

In Tables III, IV and V the distances from the Atlantic American ports to Pacific countries, by way of a Nicaragua Canal and by way of existing routes, are compared.

In Table III the distances from representative ports of the Atlantic and Gulf to Yokohama, Shanghai, and Hong Kong by way of the various alternative routes are given. The distances given in the table are those which a vessel would take in going by actual commercial routes. It has been deemed more important to deal with distances by commercial routes rather than by the shortest possible course. The shortest route from the American isthmus to Japan or China is by way of the Great Circle. The distance from Brito to Yokohama direct is 7,122; via Magdalena Bay, Lower California, 7,144; via San Francisco, 7,236; and via Hono-

lulu, 7,610. By the Great Circle route a vessel can call at San Francisco by adding only 114 miles to its voyage; and with this call at San Francisco included, the distance from New York to Shanghai by the Great Circle and Yokohama is 374 miles less than via Honolulu and Yokohama. The Nicaragua route is shorter than the Suez route for all Asiatic points mentioned in the table, the advantages of the Nicaragua route being greater for our Gulf ports than for those on the Atlantic. Especial note may be made of the fact that the distance to Hong Kong by way of Honolulu, Guam, and Manila is considerably greater than by a route which enables a vessel to call en route at San Francisco, Yokohama, and Shanghai. The latter route is 536 miles less for a vessel starting from New York.

In order to compare the distances by various routes connecting our eastern seaboard with Manila, Table IV has been prepared.

It will be seen in the table that the distance from New York to Manila by way of San Francisco, the Great Circle and Yokohama is 11,207 miles, and that the distance by way of Honolulu and Guam is 11,274 miles. The Suez route is longer than either of these routes, being 11,601 miles. A vessel bound from New York or New Orleans, or any other Eastern seaport to Manila, can call at San Francisco, Yokohama, and Hong Kong en route by adding 720 miles to the length of a voyage by way of Honolulu and Guam. Manila, it will also be noticed, is somewhat nearer the eastern part of the United States by way of the Nicaragua Canal than by way of Suez.

The manner in which the Nicaragua Canal would affect the distances between our eastern seaboard and Australia is shown by Table V.

The distance from New York to Australia by the Cape of Good Hope is practically the same as by the Suez Canal, and the Cape route has the advantage of more favourable winds and currents and of a cooler temperature. Vessels going from our eastern coast to Australia always round the Cape; accordingly, the comparisons of Table V are between the Nicaragua and Good Hope routes. Steamers bound for Australia via the Cape usually call at St. Vincent for coal; hence the distances given in the table include a call at that island. The route between the American isthmus and Australia and New Zealand is by way of the centrally-located Island of Tahiti, which may become an important coaling station upon the opening of the Isthmian Canal.

New York is 3,982 miles nearer Sydney by way of Brito and

Tahiti than via St. Vincent, Good Hope, Adelaide, and Melbourne. Adelaide is 1,816* miles nearer New York, and 3,587 miles nearer New Orleans hy Brito and Tahiti than by Good Hope. Wellington will be brought 5,617† miles nearer New York by a Nicaragua Canal.

In Table VI the distances from Liverpool to Australasia and the Orient by way of the Nicaragua and Suez routes are contrasted.

With the exception of Wellington, the Pacific ports named in Table VI are nearer Liverpool via the Suez Canal than by way of Nicaragua. From Liverpool to Sydney, however, the distance via Brito and Tahiti is only 172 miles more than via Suez, Colombo, Adelaide, and Melbourne. Yokohama is but 547 miles farther from Liverpool via Brito and San Francisco than via the easterly route.

The route from Liverpool to Japan and China by way of the American isthmus passes close to both the Atlantic and Pacific seaboards of the United States. A vessel would add but 323 miles to the length of the voyage from Liverpool to Greytown by calling at New York city, the port ordinarily having the largest foreign commerce of any city in the world, and an export traffic going in all directions. By calling at the South Atlantic or Gulf ports of the United States, the raw and manufactured cotton which is exported in large quantities from the United States across the Pacific could be added to the vessel's cargo. A call at San Francisco or some other west coast port of the United States would enable the vessel to participate in the grain and lumber trade from the United States to Oriental countries. If the vessel making the trip from Liverpool to Asia is sailed under the American flag, it can participate in the coasting trade between the two seaboards of the United States.

The line connecting the places equidistant from Liverpool by way of the Nicaragua and Suez routes passes between New Zealand and Australia, runs east of the main island of Japan, and touches the continent of Asia on the Manchurian coast, some distance north of Vladivostok. As far as distance alone is determinative, the commerce of Liverpool with Australia and the Far East is tributary to the Suez route; but the commercial factors other than distance will, in all probability, so affect the routes of trade as to

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*Omitting stop at Tahiti would add 52 miles to this figure; and if Melbourne were reached by Wellington rather than by Sydney it should be increased by 232 miles.

†Omitting stop at Tahiti would add 185 miles to this figure.

cause some of the outbound and inbound trade of Liverpool with the East to make use of the westerly route.

For the purpose of showing the relative advantages, as far as distance is concerned, which New York and Liverpool will possess for the Eastern trade after the isthmian canal has been completed, Table VII has been prepared.

New York will be nearer than Liverpool to New Zealand and the commercially important half of Australia. Liverpool, by way of the Suez route, will be nearer than New York by way of the Nicaragua route to the Philippines, Hong Kong, and Southern Asia. Shanghai will be almost the same distance from New York as from Liverpool. The advantage in favour of New York by way of Brito, San Francisco, the Great Circle, and Yokohama being 83 miles, the route from Liverpool by way of the Suez, including a call at Colombo, Singapore, and Hong Kong, Northern China, Manchuria, and Japan, will be considerably nearer New York than to Liverpool.

The line connecting the points equally distant from Liverpool and New York by the Suez and Nicaragua routes respectively, runs through the central part of Australia, through the western part of New Guinea, east of the Philippine Islands, and touches the mainland of Asia a little north of Shanghai.

Tables I–VII show the effect which a Nicaragua Canal would have upon the ocean distances from our eastern seaboard to the Pacific countries of America, Australia, and Asia. These tables also show the manner in which the comparative distances from our eastern seaboard and from Europe would be modified by a Nicaragua Canal. In Table VIII the Nicaragua and Panama Canal routes are contrasted, and the distances from typical Atlantic and Gulf ports of the United States and from representative European cities to the western coast of the American continents and to trans-Pacific countries by way of each canal route are given.

Table VIII shows very clearly that the Panama route is the more advantageous for the West South American trade, both with Europe and the United States. For the commerce of Europe and the United States with every other Pacific country, with the exception of New Zealand, to which the distances are practically equal, the Nicaragua is shorter than the Panama route. If the call be made at Tahiti on the voyage between Wellington and the American isthmus, the Nicaragua route is somewhat shorter than the one across Panama for the trade of North Atlantic countries with

New Zealand. If this voyage be made without the call at Tahiti, distance by way of the two canal routes is practically the same.

For convenience of comparison the following brief table is serviceable. The distances from New York, New Orleans, and Liverpool by way of the Nicaragua and Panama canal routes to San Francisco, Yokohama, Hong Kong, Sydney, Wellington, and Iquique are shown:

DISTANCES FROM NEW YORK, NEW ORLEANS AND LIVERPOOL VIA NICARAGUA AND PANAMA TO PACIFIC PORTS.

	New York.		New Orleans.		Liverpool.	
	Nicaragua.	Panama.	Nicaragua.	Panama.	Nicaragua.	Panama.
San Francisco.....	4,921	5,299	4,118	4,698	7,651	8,038
Yokohama.....	9,457	9,835	8,654	9,234	12,187	12,574
Hong Kong.....	11,366	11,744	10,563	11,143	14,096	14,483
Sydney via Tahiti....	9,676	9,852	8,873	9,251	12,406	12,591
Wellington via Tahiti.	8,716	8,892	7,913	8,291	11,446	11,631
Iquique.....	4,393	4,021	3,590	3,420	7,123	6,670

I.—DISTANCES VIA THE NICARAGUA AND MAGELLAN ROUTES BETWEEN THE EASTERN PORTS OF THE UNITED STATES AND THE PORTS OF THE WEST COAST OF NORTH, CENTRAL AND SOUTH AMERICA.

FROM	VIA	TO SITKA.	TO PORT TOWNSEND.	TO PORTLAND.	TO SAN FRANCISCO.	TO SAN DIEGO.	TO ACAPULCO.	TO SAN JOSÉ DE GUATEMALA.	TO HONOLULU.	TO GUAYAQUIL.	TO CALLAO.	TO IQUIQUE.	TO VALPARAISO.	TO CORONEL.
Portland, Me.	Nicaragua.....	6,418	5,891	5,766	5,116	4,668	3,291	2,736	6,626	3,441	3,946	4,588	5,173	5,356
	Magellan*.....	15,021	14,494	14,369	13,719	13,342	11,896	11,466	14,854	10,428	9,707	9,226	8,466	8,235
Boston.....	Nicaragua.....	6,373	5,856	5,731	5,081	4,933	3,256	2,761	6,591	3,403	3,911	4,553	5,138	5,321
	Magellan*.....	14,986	14,459	14,334	13,684	13,307	11,861	11,431	14,819	10,393	9,672	9,199	8,431	8,200
New York...	Nicaragua.....	6,223	5,696	5,571	4,921	4,473	3,096	2,541	6,431	3,246	3,751	4,393	4,978	5,161
	Magellan.....	15,016	14,489	14,364	13,714	13,337	11,891	11,461	14,849	10,423	9,702	9,221	8,461	8,230
Philadelphia.	Nicaragua....	6,171	5,636	5,511	4,861	4,413	3,036	2,481	6,371	3,186	3,691	4,333	4,918	5,101
	Magellan*.....	15,066	14,539	14,414	13,764	13,387	11,941	11,511	14,899	10,473	9,752	9,271	8,511	8,280
Baltimore...	Nicaragua.....	6,143	5,616	5,491	4,841	4,393	3,016	2,461	6,351	3,166	3,671	4,313	4,898	4,581
	Magellan*.....	15,078	14,551	14,426	13,776	13,399	11,953	11,523	14,911	10,485	9,764	9,283	8,523	8,292
Norfolk.....	Nicaragua.....	6,013	5,486	5,361	4,711	4,263	2,886	2,331	6,221	3,036	3,541	4,191	4,768	4,951
	Magellan*.....	14,942	14,415	14,290	13,640	13,263	11,817	11,387	14,775	10,349	9,628	9,147	8,387	8,156
Charleston...	Nicaragua†....	5,727	5,200	5,075	4,425	3,977	2,600	2,045	5,935	2,750	3,255	3,897	4,482	4,665
	Magellan*....	14,951	14,424	14,299	13,649	13,272	11,826	11,396	14,784	10,358	9,637	9,156	8,396	8,165
Savannah ...	Nicaragua‡....	5,733	5,206	5,081	4,421	3,983	2,606	2,051	5,941	2,756	3,261	3,903	4,488	4,671
	Magellan*.....	14,980	14,453	14,328	13,678	13,301	11,855	11,425	14,813	10,387	9,666	9,185	8,425	8,194
Jacksonville.	Nicaragua§....	5,683	5,156	5,031	4,381	3,933	2,556	2,001	5,891	2,706	3,211	3,853	4,438	4,621
	Magellan*.....	14,955	14,428	14,303	13,653	13,276	11,830	11,400	14,788	10,362	9,641	9,160	8,400	8,169
Port Tampa.	Nicaragua.....	5,280	4,753	4,628	3,978	3,530	2,153	1,598	5,488	2,303	2,808	3,450	4,035	4,218
	Magellan*.....	15,116	14,589	14,464	13,814	13,437	11,991	11,561	14,949	10,523	9,802	9,321	8,561	8,339
Penascola....	Nicaragua....	5,386	4,859	4,734	4,084	3,636	2,259	1,704	5,594	2,409	2,914	3,556	4,144	4,324
	Magellan*.....	15,320	14,793	14,668	14,018	13,641	12,195	11,765	15,153	10,727	10,006	9,525	8,765	8,534
Mobile.....	Nicaragua.....	5,314	4,886	4,761	4,111	3,663	2,286	1,731	5,621	2,436	2,941	3,583	4,168	4,351
	Magellan*.....	15,362	14,835	14,710	14,060	13,683	12,237	11,807	15,195	10.769	10,048	9,567	8,807	8,576
New Orleans.	Nicaragua.....	5,420	4,893	4,768	4,118	3,670	2,293	1,738	5,628	2,443	2,948	3,590	4,175	3,558
	Magellan*.....	15,416	14,889	14,764	14,114	13,737	12,291	11,861	15,249	10,823	10,102	9,621	8,861	8,630
Galveston...	Nicaragua.....	5,603	5,076	4,951	4,301	3,853	2,476	1,921	5,811	2,626	3,131	3,773	4,358	4,541
	Magellan*.....	15,598	15,071	14,946	14,296	13,919	12,473	11,043	15,431	11,005	10,284	9,803	9,043	8,812

* Via Pernambuco, Callao and San Francisco for points beyond these ports.
† Vessels going by west end of Cuba will shorten voyage 69 miles for Charleston.
‡ 104 for Savannah.
§ 136 for Jacksonville.

II.—DISTANCES FROM EUROPE TO PACIFIC PORTS VIA THE NICARAGUA CANAL AND THE STRAITS OF MAGELLAN.

TO	From Liverpool via		From Hamburg via		From Antwerp via		From Bordeaux via		From Gibraltar via	
	NICARAGUA.	MAGELLAN*.	NICARAGUA.	MAGELLAN*.	NICARAGUA.	MAGELLAN*.	NICARAGUA.	MAGELLAN*.	NICARAGUA.	MAGELLAN*.
Sitka	8,939	15,386	9,470	15,836	9,191	15,557	8,941	15,073	8,675	14,455
Port Townsend	8,426	14,859	8,943	15,309	8,664	15,030	8,414	14,546	8,148	13,928
Portland	8,287	14,734	8,818	15,184	8,359	14,905	8,289	14,421	8,026	13,803
San Francisco	7,651	14,084	8,168	14,534	7,889	14,255	7,639	13,771	7,373	13,153
San Diego	7,201	13,707	7,718	14,157	7,439	13,878	7,189	13,394	6,923	12,776
Acapulco	5,826	12,261	6,343	12,771	6,064	12,432	5,814	11,948	5,548	11,330
San José de Guatemala	5,271	11,831	5,788	12,281	5,509	12,002	5,259	11,518	4,993	10,900
Honolulu	9,161	15,219	9,678	15,669	9,399	15,390	9,149	14,906	8,883	14,288
Guayaquil	5,975	10,722	6,493	11,172	6,214	10,893	5,964	10,409	9,698	9,791
Callao	6,481	10,072	6,998	10,522	6,719	10,243	6,469	9,259	6,203	9,141
Iquique	7,123	9,591	7,640	10,041	7,361	9,762	7,111	9,278	6,845	8,660
Valparaiso	7,708	8,831	8,222	9,281	7,946	9,002	7,696	8,518	7,430	7,900
Coronel	7,891	8,600	8,408	9,050	8,129	8,771	7,879	8,287	7,613	7,669

* Via Pernambuco, Callao, and San Francisco for ports north of those cities.

III.—DISTANCES FROM ATLANTIC AMERICAN PORTS TO YOKOHAMA, SHANGHAI AND HONG KONG VIA THE NICARAGUA AND SUEZ ROUTES.

FROM	To Yokohama via			To Shanghai via			To Hong Kong via			
	San Francisco and Great Circle.	Honolulu.	Suez*, Colombo, Singapore, Hong Kong and Shanghai.	San Francisco, Great Circle and Yokohama.	Honolulu and Yokohama.	Suez†, Colombo, Singapore and Hong Kong.	San Francisco Great Circle, Yokohama and Shanghai.	Honolulu, Yokohama, Shanghai.	Honolulu, Guam and Manila.	Suez, Colombo, Singapore.
Portland	9,652	10,026	13,330	10,702	11,076	12,280	11,561	11,935	12,097	11,421
Boston	9,617	9,991	13,370	10,667	11,041	12,320	11,526	11,900	12,062	11,461
New York	9,457	9,831	13,564	10,507	10,881	12,514	11,366	11,740	11,902	11,655
Philadelphia	9,397	9,771	13,707	10,447	10,821	12,657	11,306	11,680	11,842	11,798
Baltimore	9,377	9,751	13,852	10,427	10,801	12,802	11,286	11,660	11,822	11,943
Norfolk	9,247	9,621	13,727	10,297	10,671	12,677	11,156	11,530	11,692	11,818
Charleston	9,037‡	9,411‡	13,982	10,087‡	10,461‡	12,932	10,946‡	11,320‡	11,482‡	12,073
Savannah	9,043§	9,417§	14,057	10,093§	10,467§	13,007	10,952§	11,326§	11,488§	12,148
Jacksonville	9,001‖	9,375‖	14,137	10,051‖	10,425‖	13,087	10,910‖	11,248‖	11,446‖	12,228
Port Tampa	8,514	8,888	14,629	9,564	9,938	13,579	10,423	10,797	10,959	12,720
Pensacola	8,620	8,994	14,833	9,670	10,044	13,783	10,529	10,903	11,065	12,924
Mobile	8,647	9,021	14,875	9,697	10,071	13,825	10,556	10,930	11,092	12,966
New Orleans	8,654	9,028	14,929	9,704	10,078	13,879	10,563	10,937	11,099	13,020
Galveston	8,757	9,131	15,111	9,807	10,181	14,061	10,666	11,040	11,202	13,202

* Direct voyage from Singapore to Yokohama reduces this distance by 393 miles.

† Direct voyage from Singapore to Shanghai reduces this distance by 66 miles.

‡ Vessels going by west end of Cuba will shorten voyage 69 miles for Charleston.

§ 104 miles for Savannah.

‖ 136 miles for Jacksonville.

IV.—DISTANCES FROM AMERICAN ATLANTIC PORTS TO MANILA VIA NICARAGUA AND SUEZ ROUTES.

FROM	VIA SAN FRANCISCO, GREAT CIRCLE AND YOKOHAMA	VIA HONOLULU AND YOKOHAMA.	VIA HONOLULU, YOKOHAMA, SHANGHAI AND HONG KONG.	VIA HONOLULU AND GUAM.	VIA SUEZ, COLOMBO, SINGAPORE.
Portland	11,402	11,776	12,563	11,469	11,367
Boston	11,367	11,741	12,528	11,434	11,407
New York	11,207	11,581	12,368	11,274	11,601
Philadelphia	11,147	11,521	12,308	11,214	11,744
Baltimore	11,127	11,501	12,288	11,194	11,889
Norfolk	10,997	11,371	12,158	11,064	11,764
Charleston*	10,711	11,085	11,872	10,778	12,019
Savannah†	10,717	11,091	11,878	10,784	12,094
Jacksonville‡	10,667	11,041	11,828	10,734	12,174
Port Tampa	10,264	10,638	11,425	10,331	12,266
Pensacola	10,370	10,744	11,531	10,437	12,870
Mobile	10,397	10,771	11,558	10,464	12,912
New Orleans	10,404	10,778	11,565	10,471	12,966
Galveston	10,587	10,961	11,748	10,654	13,148

* The route to Greytown via west end of Cuba is 69 miles less.
† The route to Greytown via west end of Cuba is 104 miles less.
‡ The route to Greytown via west end of Cuba is 136 miles less.

V.—DISTANCES BETWEEN THE EASTERN SEABOARD OF THE UNITED STATES AND AUSTRALIA VIA THE NICARAGUA AND SUEZ ROUTES.

FROM	To Adelaide via		To Melbourne via		To Sydney via		To Wellington via		
	BRITO, TAHITI, SYDNEY, MELBOURNE.	ST. VINCENT, CAPE OF GOOD HOPE.	BRITO, TAHITI AND SYDNEY.	ST. VINCENT, CAPE OF GOOD HOPE, ADELAIDE.	BRITO AND TAHITI.*	ST. VINCENT, GOOD HOPE, ADELAIDE AND MELBOURNE.	BRITO AND TAHITI*.	ST. VINCENT, CAPE OF GOOD HOPE AND MELBOURNE.	STRAITS OF MAGELLAN.
Portland.....	10,954	12,446	10,446	12,954	9,871	13,529	8,911	14,204	11,419
Boston	10,919	12,459	10,411	12,967	9,836	13,542	8,876	14,217	11,384
New York.....	10,759	12,575	10,251	13,083	9,676	13,658	8,716	14,333	11,414
Philadelphia.....	11,699	12,641	10,191	13,149	9,616	13,724	8,656	14,399	11,464
Baltimore.....	10,679	12,736	10,171	13,244	9,596	13,819	8,632	14,494	11,476
Norfolk	10,549	12,614	10,041	13,122	9,466	13,697	8,510	14,372	11,140
Charleston	10,265	12,761	9,155	13,269	9,180	13,844	8,220	14,519	11,349
Savannah.....	10,269	12,821	9,671	13,329	9,186	13,904	8,226	14,579	11,378
Jacksonville.....	10,219	12,846	9,711	13,354	9,136	13,929	8,196	14,604	11,353
Port Tampa.....	9,816	12,243	9,308	13,751	8,733	14,326	7,773	15,001	11,514
Pensacola.....	9,922	13 447	9,414	13,955	8,839	14,530	7,879	15,205	11,718
Mobile.....	9,949	13,489	9,441	13,997	8,866	14,572	7,906	15,247	11,760
New Orleans	9,956	13,543	9,448	14,051	8,873	14,626	7,913	15,301	11,814
Galveston.....	10,139	13,725	9,631	14,233	9,056	14,808	8,096	15,483	11,996

*The course from Brito to Sydney direct, omitting call at Tahiti, would be 52 miles less.

VI.—DISTANCES FROM LIVERPOOL TO THE EAST BY THE SUEZ AND NICARAGUA ROUTES.

TO	Suez Route		Nicaragua Route.		Difference Suez–Nicaragua†
	Ports of call.	Miles.	Ports of call.	Miles.	
Adelaide	Aden,* Colombo, Kg. George Sound.....	11,151	Brito, Tahiti, Sydney, Melbourne‖	13,489	−2,338
Melbourne ..	Aden,* Colombo, Kg. George Sd., Adel.....	11,659	Brito, Tahiti, Sydney‖.....	12,981	−1,322
Sydney	Aden,* Colombo, Kg. G. Sd., Adel., Mel.....	12,234	Brito, Tahiti‖	12,406	− 172
Wellington ..	Aden,* Colombo, K. G. S., Melbourne.....	12,949	Brito, Tahiti§	11,446	†1,503
Manila.....	Aden,* Colombo, Singapore.....	9,677	Brito, San Francisco, Yokohama‡.....	13,937	−4,260
Hongkong ..	Aden,* Colombo, Singapore.....	9,731	Brito, San Francisco, Yokohama†.....	13,777	−4,046
Tientsin.....	Aden, Colombo, Sing., Hongk., Shanghai.....	11,362	Brito, San Francisco, Yokohama.....	13,554	−2,192
Yokohama...	Aden, Colombo, Sing., Hongk., Shanghai.....	11,640	Brito, San Francisco.....	12,187	− 547

* Direct voyage from Aden to King George Sound would shorten these routes 540 miles.

† A stop at Shanghai would add to this route 319 miles.

‡ A stop at Shanghai would add to this route 535 miles.

§ Direct voyage from Brito to Wellington would shorten this distance by 185 miles and make the difference 1,688 miles.

‖ Direct voyage from Brito to Sydney would shorten these routes 52 miles.

VII.—COMPARISONS OF DISTANCES FROM NEW YORK AND LIVERPOOL TO AUSTRALASIAN AND ASIATIC PORTS VIA THE NICARAGUA AND SUEZ ROUTES.

TO	FROM NEW YORK		FROM LIVERPOOL.		DIFFERENCE SUEZ–NICARAGUA†
	ROUTE.	MILES.	ROUTE.	MILES.	
Wellington..	Brito, Tahiti.....	8,716	Aden‡, Colombo, Kg. George Sd. Melbourne.....	12,949	†4,233
Sidney.....	Brito, Tahiti*.....	9,676	Aden‡, Colombo, Kg. George Sd., Adel., Melbourne.	12,234	†2,558
Adelaide....	Brito, Tahiti*, Sydney†, Melbourne.....	10,759	Aden‡, Colombo, Kg. George Sd	11,151	† 392
Manila.....	Brito, San Francisco, Gt. Circle, Yokohama....	11,207	Aden, Colombo, Singapore.....	9,677	–1,530
Hongkong..	Brito, San Francisco, Gt. Circle, Yokohama....	11,047	Aden, Colombo, Singapore.....	9,731	–1,316
Shanghai....	Brito, San Francisco, Gt. Circle, Yokohoma....	10,507	Aden, Colombo, Singapore, Hongkong.....	10,590	† 83
Tientsien....	Brito, San Francisco, Gt. Circle, Yokohama....	10,824	Aden, Colombo, Singapore, Hongkong, Shanghai...	11,362	† 538
Yokohama...	Brito, San Francisco, Gt. Circle.....	9,457	Aden, Colombo, Singapore, Hongkong, Shanghai...	11,640	†2,183

* Omitting stop at Tahiti will shorten voyage 52 miles.

† If vessel goes by Wellington and Melbourne, voyage will be shortened 232 miles.

‡ Omitting stop at Colombo will shorten voyage 540 miles.

VIII.—COMPARISON OF DISTANCES FROM AMERICAN AND EUROPEAN ATLANTIC PORTS TO PACIFIC PORTS VIA THE NICARAGUA AND PANAMA CANALS.

FROM	VIA	TO PORT TOWNSEND VIA SAN FRANCISCO.	TO SAN FRANCISCO.	TO GUAYAQUIL.	TO CALLAO.	TO IQUIQUE.	TO VALPARAISO.	TO CORONEL.	TO YOKOHAMA VIA SAN FRANCISCO.	TO SHANGHAI *VIA SAN FRANCISCO AND YOKOHAMA.	TO MANILA *VIA SAN FRANCISCO AND YOKOHAMA.	TO SYDNEY †VIA TAHITI.	TO MELBOURNE ‡VIA TAHITI§ AND SYDNEY.	TO WELLINGTON VIA TAHITI§.
New York...	Nicaragua....	5,696	4,921	3,246	3,751	4,393	4,928	5,161	9,457	10,507	11,207	9,676	10,251	8,716
	Panama.....	6,074	5,299	2,864	3,359	4,021	4,630	4,838	9,835	10,885	11,585	9,852	10,427	8,892
Norfolk.....	Nicaragua...	5,485	4,710	3,035	3,540	4,182	4,767	4,950	9,247	10,297	10,997	9,466	10,041	8,505
	Panama.....	5,872	5,097	2,662	3,157	3,819	4,428	4,636	9,634	10,684	11,384	9,650	9,858	8,690
Charleston...	Nicaragua....	5,276	4,501	2,826	3,331	3,973	4,558	4,741	9,037	9,957	10,505	9,250	9,831	8,296
	Panama.....	5,673	4,898	2,463	2,958	3,638	4,229	4,437	9,344	10,367	10,809	9,451	10,006	8,491
Port Tampa.	Nicaragua ...	4,753	3,978	2,303	2,808	3,450	4,035	4,218	8,514	9,564	10,264	8,733	9,308	7,773
	Panama.....	5,328	4,553	2,098	2,593	3,255	3,864	4,072	9,069	10,119	10,819	9,086	9,661	8,126
New Orleans.	Nicaragua....	4,893	4,118	2,443	2,948	3,590	4,175	4,358	8,654	9,704	10,404	8,873	9,448	7,913
	Panama.....	5,477	4,698	2,263	2,758	3,420	4,029	4,237	9,234	10,284	10,984	9,251	9,826	8,291
Galveston...	Nicaragua....	4,996	4,221	2,546	3,051	3,693	4,278	4,461	8,757	9,887	10,587	9,056	9,551	8,016
	Panama.....	5,574	4,799	2,364	2,858	3,520	4,129	4,338	9,335	10,385	11,085	9,352	9,927	8,392
Liverpool...	Nicaragua....	8,426	7,651	5,975	6,481	7,123	7,708	7,891	12,187	13,237	13,937	12,406	12,891	11,446
	Panama.....	8,813	8,038	5,603	6,098	6,760	7,369	7,577	12,574	13,624	14,324	12,591	13,166	11,631
Hamburg...	Nicaragua....	8,943	8,168	6,493	6,998	7,640	8,225	8,408	12,704	13,754	14,454	12,923	13,498	11,963
	Panama.....	9,242	8,467	6,032	6,527	7,189	7,798	8,006	13,003	14,053	14,753	13,020	13,595	12,060
Antwerp....	Nicaragua....	8,664	7,889	6,214	6,719	7,361	7,946	8,129	12,425	13,475	14,175	12,644	13,219	11,684
	Panama.....	8,963	8,188	5,753	6,248	6,910	7,519	7,727	12,724	13,774	14,474	12,741	13,316	11,781
Bordeaux....	Nicaragua....	8,414	7,639	5,964	6,469	7,111	7,696	7,879	12,175	13,225	13,925	12,394	12,969	11,434
	Panama.....	8,713	7,938	5,503	5,998	6,660	7,269	7,477	12,474	13,524	14,224	12,491	13,066	11,471
Gibraltar....	Nicaragua....	8,148	7,373	5,698	6,203	6,845	7,430	7,613	11,909	12,959	13,659	12,128	12,703	12,800
	Panama.....	8,447	7,672	5,237	5,723	6,394	7,003	7,211	12,208	13,258	13,958	12,225	11,168	11,265

* Via Honolulu and 374 miles for Nicaragua and 252 for Panama.
† Omitting Tahiti reduces voyage from Brito by 52 miles.
‡ Voyage from Brito to Sydney by Wellington is 232 miles less than by way of Tahiti; from Panama it is 405 miles less.
§ Voyage from Brito to Wellington direct is 185 miles shorter than via Tahiti, and from Panama it is 358 miles shorter.